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Individual Instruction in Rifle Practice

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Captain U. S. Army

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INTRODUCTION.

The system of instruction in rifle shooting as set forth herein is the one that was used at Fort Lawton in 1915, where every man in the Battalion qualified as Marksman or better, with one exception, and they are now drawing extra pay as good shots. The one exception was not a man that we could not teach to shoot. He had been making expert scores up until a few days before the record test. He then went absent without leave and due to his misconduct while absent he was in such a state of mind and nerves when he returned that he did not qualify even as Marksman.

We had all kinds of men to deal with, men who had never shot at all before, men who had been shooting nearly all their lives and had always been mediocre shots, and re-enlisted men from other regiments who had shot through a number of target seasons and had never qualified. These last were the hardest to deal with as they were all convinced that it was impossible for them to learn to shoot.

In the four companies of the Battalion there were 263 men. At the end of the target season the Battalion had 167 Expert Riflemen, 68 Sharpshooters, 27 Marksmen, and 1 first class man. Forty-seven of the Experts were hold-over men who had qualified as Experts the previous year and did not have to fire.

There is nothing revolutionary in this system. Practically all of the points emphasized therein have been recognized in the past by good shots as being correct. These points have been combined, systematized and reduced to simple language. An effort has been made to include all that the average soldier should know to become a good

shot and no more. It does not pretend to be an exhaustive treatment of the subject of rifle shooting. A great mass of scientific data and information upon which rifle shooting is based is left out entirely as being difficult for the beginner to understand and more likely to confuse than to aid him.

METHODS OF INSTRUCTION.

The exact methods to be used in instructing men in the points laid down herein will of course vary in some degree with each Instructor and will also vary according to the character, peculiarities, temperament and brain power of each man under instruction. There is no short cut to shooting efficiency. Hard work and lots of it, on the part of the Instructor, is an absolute essential. This system is not automatic. Merely to supply each man with a copy of this book without any particular effort to see that all of the points are understood and applied would not produce any very remarkable results. The instruction must be thorough and it must be individual. General instruction of the command is not sufficient. It cannot be given in groups of eight or four or even two. The Instructor must satisfy himself that each man understands each and every point and can explain it in his own words.

If a Company Commander has to instruct through the Platoon Leaders on account of the size of the command, he must see to it that each Platoon Leader, and in fact each non-commissioned officer in the company, thoroughly understands each point and is able to impart his knowledge to his men. He must carefully supervise them while instructing their men and he should pick out men at random through the different Platoons from time to time and put them through a test to see if their instruction has been thorough and is progressing satisfactorily.

The importance of exactness should be impressed on the men at all times. For example, men in adjusting the sights in the sighting drills or triangle exercises are apt to say, "That is about right." There is no such thing as a sight that is about right; it is either absolutely right or it is all

wrong. Exactness in every detail is hard to get but it is well worth striving for.

Interest and enthusiasm, as in every game, are a big asset and everything should be done to stimulate them. For example, triangle sighting exercises at 200, 300, 500 and 600 yards, using a disk the size of the corresponding bulls-eye helps to sustain the interest in that form of sighting drill, and individuals and squads should be encouraged to compete against each other in making small triangles.

The sighting and trigger exercises are very important but they must not be allowed to deteriorate into a mere perfunctory performance of a physical exercise. A very little of the so-called "Push and Pull" exercises at any one time is enough; any more than a very little is a great deal too much.

The two most important points are: the trigger squeeze on the part of the man firing, and the watching of his right eye by the coach to see if he is squeezing the trigger properly. The description of the trigger squeeze is a little different from the usual way of stating it. We have always been told by the authorities on shooting that the trigger must be squeezed by a STEADY increase of pressure. But this does not mean much to the average beginner. Now if we analyze this STEADY or uniform increase of pressure we find that, if it is in fact a steady increase, a man cannot know exactly when enough pressure has been applied to set the rifle off. A fine instrument will show that the amount of pressure necessary to discharge the piece will vary a little with every shot. If a man knows when his rifle is going off it is because he suddenly gives it all of the rest of the necessary pressure. In this case it is not a steady increase. If the increase of pressure is steady the man cannot know when the rifle will be discharged, consequently, in order to have him squeeze the trigger properly he is told to squeeze it in such a way as not to know just when the rifle will go off. This does not mean that the process is necessarily a slow one and that it will take a comparatively long time to fire a shot. A man THROUGH TRAINING can reduce the time used in pressing the trigger to as low a point as one second and

still press it in such a way as not to know at just which part of the second the discharge will take place. Once a man has acquired the ability to squeeze the trigger properly, even though it be very slowly, he rapidly learns to speed up on it without changing the process.

The blank form, a model of which is given in the back of the book, is very useful in checking up the instruction of the men. When this record is kept the Company Commander can tell at a glance just what points each man has qualified in and upon what points he still needs instruction.

At the firing point, whether it be with a Hollifield Rod, at Gallery Practice or on the range, each man should have a good coach beside him to watch him and point out his errors. A coach must watch the man himself. If a coach watches the target instead of watching the man firing, as a great many are apt to do, he might as well not be there at all.

The course of instruction is divided into two parts, preparatory exercises and range practice. Practically everything is included under the heading of preparatory exercises, because this is the period of training during which the man learns everything necessary to become a good shot. When he goes on the range he will be able to start in shooting well if he applies what he has learned previously. And if he has been properly instructed he will put into practice all the points laid down in the preliminary exercises, with the one exception of trigger squeeze, the most important of all, and the one thing over which he at first has no control.

Practically all of the range practice then can be devoted to teaching him the trigger squeeze. To squeeze the trigger properly the man must have will power and self control, two traits that must be developed in the man by careful study of his character and temperament and patient and untiring coaching during the firing of each shot.

PREPARATORY EXERCISES

All Men to Take Preparatory Course.

Every man who is to fire on the range should be put through the preparatory course from the beginning. No distinction should be made between recruits and men who have had range practice, no matter what their previous qualification has been. Some part of the preparatory instruction may have escaped them in previous years, it is certain that some of it has been forgotten, and in any case it will be a help to go over it again and refresh the mind on the subject.

It is a good practice to look over each man's Target Record of last year to see at what ranges he was weak and upon what points he needs particular instruction this year.

All of the non-commissioned officers of the Company should be put through a course of instruction and required to pass a rigid test before the period of preliminary instruction for the Company begins.

DEFINITIONS.

Each man should know the meaning of the following words; they are defined in the preface of the Small Arms Firing Manual: *Battle Sight, Butts, Cant, to Cant the Rifle, Drift, Grooves, Lands, Line of Aim, Trajectory, O'Clock, Prone, Ricochet Shots, Score, Sighting Shots, Twist, Windage, Wind Guage.*

NOMENCLATURE OF THE RIFLE.

The following parts will be pointed out and the functions of each explained: Barrel, bolt, butt plate, butt swivel, cut-off, ejector, extractor, firing pin, floor plate, follower, front sight, guard, guard screws, hand guard,

lower band, lower band swivel, magazine spring, main-spring, rear sight, leaf, movable base, slide, slide binding screws, slide cap, windage screw, receiver, safety lock, sleeve, stacking swivel, stock, stricker, trigger and upper band. Also bore, muzzle, breech, magazine cams and bearings.

INTERESTING DATA CONCERNING RIFLE.

The barrel is 24.006 inches in length and the rifling consists of four plain grooves .004 inches deep. The grooves are three times as wide as the lands. The twist is uniform, one turn in 10 inches. The muzzle is rounded to protect the rifling.

The bullet has a core of lead and tin composition incased in a jacket of cupro nickel. It weighs 150 grains, and the point is sharper and offers less resistance to the air than any previous model in the United States service.

The powder charge is of pyro-cellulose composition, very similar to the powder used in field and seacoast guns. The grains are small, cylindrical, perforated and graphited. The normal charge weighs from 47 to 50 grains, depending upon the lot of powder used.

The standard muzzle velocity is 2700 feet per second. The instrumental velocity measured at 78 feet from the muzzle is 2640 feet per second with an allowed mean variation of 20 feet per second on either side of the standard. The cartridge complete weighs about 392 grains. The muzzle velocity of 2700 feet is obtained when fired on a normal day (70° F.). This velocity will vary directly with the temperature 1.5 feet per degree. For each degree above 70, 1.5 feet must be added to 2700 feet to obtain the muzzle velocity. For each degree under 70, 1.5 feet must be subtracted. From this will be seen the importance of keeping all the cartridges at a uniform temperature while firing on the range, of not leaving them lying on the ground or exposed to the sun's rays and of not loading a cartridge into a heated chamber until ready to shoot.

The bullet will penetrate 33½ inches of white pine at 50 feet, 46.7 inches at 100 yards, 24.3 inches at 500 yards,

12.8 inches at 1000 yards. At 50 feet it will penetrate 8.7 inches of moist sand but only 4 inches of dry sand, and 14 inches of loam free from sand. On thoroughly seasoned oak it will penetrate 12.2 inches at 50 feet, 33.6 inches at 100 yards. It will penetrate a brick wall 5 inches at 100 yards.

The maximum range is 3.1 miles with the muzzle elevated 45 degrees. It takes the bullet 31.36 seconds to make the flight and at its highest point it will be 6844 feet high. This height is reached when the bullet is 3432 yards from the muzzle.

The danger space for a man standing is continuous up to 600 yards.

CARE OF RIFLE.

Always clean at end of the day's shooting. Never leave rifle over night without cleaning after it has been shot.

Always clean from the BREECH. And always with a ramrod. The "pull through" is for use in the field only. Use vaseline or other heavy oil. Never use 3 in 1 oil or any other light oil.

Rifle should be cleaned out first with No. 9 or other good powder solvent. Solvent left in over night and then cleaned out and rifle oiled.

A rifle must be cleaned at least twice after being fired, once at end of the day's shooting and once the next day. Rifle cannot be properly cleaned in one cleaning because the fouling that has been driven into the pores of the metal does not sweat out where a cloth can reach it until about 24 hours after the first cleaning. If rifle is not going to be shot again soon clean it each day for three days.

Do not put any ammonia solution into the rifle unless you have special permission to do so and then only under the supervision of a noncommissioned officer. Never take your rifle apart without special permission.

Never leave a rag in the barrel of the rifle.

Never leave your rifle lying flat on the ground.

Never shoot a rifle when it has any dust, dirt or snow in

the barrel. Wipe the oil out of the barrel with a clean rag before going to the firing point. Never leave a barrel unoiled even for inspection.

Vaseline is the best oil to use on rifles.

Do not clean rifle when barrel is hot.

The following parts of the rifle only can be removed by the soldier for the purpose of cleaning: front sight cover, rear sight movable base (rear sight must not be taken apart), bolt, floor plate and follower, gun sling, oiler and thong case.

EXAMINATIONS OF RIFLES.

Each man's rifle should be closely examined before the beginning of the preparatory season for defects. Each barrel should be tested with the gauges and it should be noted if the barrel is pitted. Loose rear and front sights should be corrected, peep sights should not be smaller than size six. All screws should be tight. Upper band should be loose enough to slide on and off easily when the screw is removed. Bolt should be complete and work easily. Trigger squeeze neither too easy nor too hard, and it should be without "creep". If the blank form, a model of which is in the back of the book, be kept for each Platoon the Company Commander can tell at a glance what rifles need attention.

SIGHTING DRILLS.

Men should be carefully instructed in all of the sighting drills both with the sighting bar and the rifle as laid down in the Small Arms Firing Manual except that they should be taught that there is only one correct way of sighting, and that a sight is either correct or incorrect. The expression "Fine Sight", "Half Sight", or "Full Sight", should not be used. They should also be taught to align the sights so that the top of the front sight just barely touches the bottom of the bull's-eye and so that they can still see all of the bull's-eye clearly. This will give the faint impression of a line of white under the bull's-eye without bringing in the multitude of errors due

to telling them to have a line of white or streak of white between the bull's-eye and the front sight.

The peep sight should be used by all men in all the target practice, except in rapid fire where the battle sight is required. No man should be allowed to shoot with the open sight in slow fire no matter what his previous experience has been. The superiority of the peep over the open sight needs no argument. Do not try to shoot with the sight cover on.

TRIGGER SQUEEZE.

The one most important thing in shooting is to squeeze the trigger in such a way as to set off the rifle without spoiling the aim. To do this the trigger must be squeezed so steadily that you will not know just when the rifle will go off. Any man can hold the rifle steady enough, for a long time, to have it make a good shot. The bad shots are all made by spoiling the aim just as the rifle goes off. This is done by *PULLING* on the trigger or flinching, or both. If a man squeezes the trigger so steadily as not to know when it is going off he doesn't spoil his aim and he can't flinch because he doesn't know when to do it.

No good shot *CATCHES* his sight on the mark and then *SETS IT OFF* so as to hit the mark. That is what the poor shots do. The good shot holds the sight as nearly on the mark as possible and keeps squeezing on the trigger until it goes off. The good shot is not the man with the *QUICK EYE*. He is the man with the *SLOW TRIGGER*. This method of squeezing the trigger must be followed out in all preliminary practice or the whole value of the practice is lost.

THE GUN SLING.

The sling is a big help to everybody in shooting. It helps to keep the rifle steady and to press the butt of the rifle against the right shoulder with the same amount of force for each shot, which is very important. The gun sling takes up much of the recoil.

Each man should have his gun sling adjusted to him by the instructor, and he should be required to leave it

with that adjustment. The lower loop can be tightened enough to adjust the sling for drill or parade purposes. In shooting the sling should be as tight as it can be made and still allow the man to get into it.

The left arm is put through the upper loop from right to left and the leather keeper pulled down to hold it above the left elbow. The left hand is moved over the top of the gun sling to grasp the rifle. This causes the sling to lie smoothly along the hand and wrist. The lower loop is not used and should be loose.

The gun sling should be used in all preparatory exercises and at all extended order drills, field exercises and maneuvers.

POSITION AND AIMING DRILLS AND TRIGGER SQUEEZE EXERCISES.

These exercises are described in detail in the Small Arm Firing Manual. The application of them as laid down therein, however, should be considerably modified. The position and aiming drills sometimes called "Push and Pull" exercises, should never be kept up for more than ten minutes on any one day. The trigger squeeze exercises are described as drills executed by a number of men practically in unison. This should never be done. Each man should be instructed individually in the trigger squeeze and at first he should be as carefully coached as when he begins firing on the range. This coaching should include position, breathing, aiming, etc. He should have a small bull's-eye to aim at and the sighting device should be freely used. The man under instruction should be required to watch through the sighting device a demonstration by the instructor of correct and incorrect aiming and trigger squeezing.

The description of the trigger squeeze in the Small Arms Firing Manual should be entirely disregarded.

In all drills and field exercises where fire is simulated, men should be instructed to aim at a definite object, and to carry out the correct principles of aiming and squeezing

the trigger and to call each shot. Careless trigger squeezing in field exercises and maneuvers can easily spoil a man's chance of ever becoming a good shot.

Prone position:

In the prone position the elbows should be well under the body so as to raise the chest off the ground. Avoid spreading the elbows apart; it is an unsteady position and leaves the chest so near the ground that the neck has to be strained backward in order to see through the sight. This strained position of the neck interferes with good vision.

The best prone position is with the body lying at such an angle that the rifle will point naturally at the target when brought to the shoulder, usually almost 45 degrees. The elbows should be well under so as to raise the chest off the ground, and the eye should be as near the cocking piece as possible without taking a strained position. The position of the thumb and finger of the right hand to be such as not to hurt the face in firing. With most men the thumb should be along the stock, not over it.

Men should not be permitted to vary from the set rules as to position and methods of shooting, no matter what their previous experience has been. Some men who have individual peculiarities in position convince themselves that this position is the best for them, but experience shows that a conscientious effort on their part to shoot in the correct position always results in higher scores.

Sand Bag Rest:

It is important to have the sand bag high enough to permit the taking of the normal prone position, which is with the elbows well under, and the chest well off the ground. The natural tendency is to have a low rest and be very flat on the ground with the elbows spread apart. This is a faulty position and results in lower scores than if no rest at all were used. The sand bag where properly used is a great help. When it is not properly used it is a handicap. Arrange the sand in the bag in such a way that when you

take the normal prone position the bag will support the left forearm and wrist with the left hand resting on the top of the bag, the rifle lying on the hand. Make the sand bag fit you in your normal position. Do not alter your position to fit the sand bag.

During the period of preliminary exercises instruction should be given with the sand bag rest in, 1st: Trigger squeeze exercises; 2nd, Practice with the Hollifield Rod; 3rd, Gallery practice.

CALLING THE SHOT.

Always notice exactly where the sights are pointed when the rifle goes off and call out at once where you think the bullet hit. Call your shots even when only snapping at a mark, so as to acquire the habit. It will help you to hold closer. No man can become a good shot until he can call his shot before it is marked.

BREATHING

The proper breathing is very important and must be practiced at all times during the pointing and aiming and trigger squeeze drills. Draw in an ordinary breath and hold it while aiming and squeezing the trigger. Do not hold the breath with the throat open. Close the throat and let the lung full of air lean against the closed throat.

POSITIONS IN RAPID FIRE.

AT 200 YARDS either the sitting or kneeling position is taken upon the appearance of the target. The sitting position is much more steady than the kneeling and is assumed as easily and as rapidly. It should be used by all men.

To assume the sitting position rapidly from standing, first sit down and aim at the target to find where your heels should be and the exact spot upon which to sit. Then mark these places. At the command "ready" stand with your heels in the two heel marks and as the target appears sit down on the spot previously marked placing the right hand on the ground as you go down to prevent

shock. A few men, usually very stout ones, shoot best in the sitting position with the feet crossed, elbows well inside the knees. Men who do this can sit down without removing either hand from the rifle.

AT 300 YARDS the prone position is assumed upon the appearance of the target. The prone position can be taken and an aimed shot fired more quickly than any other position. This was proved conclusively by the "Surprise Fire" events at the National Matches of 1913.

The movement is described by the numbers for the purpose of instruction and to show the sequence of movements. After this sequence is learned it should be executed as one motion. With practice men can take the prone position and be aiming at the target in less than two seconds.

The place where the elbows are to rest having been marked, stand about two feet to the rear and a little to the left of these marks; the exact place to stand will depend on the size of each man and the angle at which he lies in the prone position. Being at the "ready", sling adjusted; (ONE) throw the right foot well back and stoop down as far as possible, placing the butt of the rifle on the ground four or five inches to the left of the spot where the right elbow is to rest, retaining the grip on the rifle with both hands; (TWO) place the right elbow on the ground in the spot marked for it; (THREE) place the left leg beside the right and slide well back, lying on the belly; (FOUR) take the butt of the rifle off the ground and place it against the right shoulder; (FIVE) lower the left elbow to the ground in the spot previously marked for it. This will bring you in your normal position, with the rifle pointing at the target. Care should be taken to place the butt of the rifle on the ground without jar and to place the elbows on the ground in the same way. With practice this position can be assumed very rapidly and without shock.

RAPID FIRE PRACTICE.

In rapid fire gain time by working the bolt rapidly, but squeeze the trigger just as carefully as in slow fire. Don't "SET IT OFF" even in rapid fire. Take such a position that each time after you have reloaded and brought the right hand to the small of the stock you will find the rifle pointing at the target. Don't move either elbow from its place in reloading.

In rapid fire don't try to hold the breath for all the ten shots; take a short breath after each shot.

Don't look into the chamber while working the bolt. This is a common fault that must be eliminated as early in the training as possible. It causes a loss of time and often results in the man's firing on the wrong target. Keep your eye on the target and count your shots so as to know when to refill the magazine.

Oil the bolt slightly with vaseline, but be careful not to have too much oil either on or in the bolt.

Be sure to get into the correct position before you begin to shoot, and always fire the first shot very carefully.

Rapid Fire Practice with Dummy Cartridges:

A great deal of rapid fire practice with dummy cartridges should be held during the preparatory stage. If possible this should be held on the full-sized targets placed 200, 300 and 500 yards away with a curtain so arranged that the face of the target can be exposed for the proper length of time and then covered again. In this practice gain time by assuming the proper position quickly and in working the bolt rapidly, but squeeze the trigger just as carefully as in slow fire.

Loading:

Men should be trained in loading rapidly in the rapid fire position with clips of service ammunition. If this training is not had during the preparatory stage a number of men are sure to bungle the reloading during rapid fire on the range.

CHANGING THE SIGHT.

Demonstrate to each man that moving the rear sight in any direction has the effect of making the barrel point more in that direction.

Have full-sized 200, 300, 500 and 600-yard slow fire targets, marked off with elevation and windage lines to correspond to the lines in the score book targets, and paste them up in or near the barracks, at the beginning of the preliminary period.

1st. Explain these targets to the man and show him why the lines are at different distances apart for each range.

2nd. Indicate the position of a shot on the target and have him correct his sight to bring the shot to the center of the bull's-eye.

3rd. Repeat this exercise with the man standing far enough away from the target so that he cannot see the lines, requiring him to plot the shot in the score book and to get his sight changes from that. Then let him come up to the target to see for himself whether he has plotted his shots accurately.

4th. Consider that the sights of his rifle are not normal, set his sights away from zero both as to windage and elevation and repeat the exercises.

5th. Have the same exercises on Rapid Fire targets to teach him how to change his windage and holding place. These drills should be frequent and the test of each man should be thorough.

Wind Gauge:

One point of windage will move a shot 4 inches for each 100 yards the rifle is distant from the target. The bullet will move the same way as the rear sight. If you want to make the bullet hit more to the left, move the rear sight to the left. If you want it to hit more to the right move the sight to the right.

EFFECTS OF WEATHER CONDITIONS.

The weather conditions except wind have very little effect on the bullet back to 600 yards. But beyond 600 yards it is very important to know what effect is produced by the different conditions and to be able to allow for them.

Wind:

The wind blows the bullet out of its path. The distance it will be blown from its path depends on the force and direction of the wind. (See charts in score book.)

Temperature of the Air:

Warm air is not as dense as cold air, it does not stop a bullet as much as cold air. So a bullet will go straighter on a warm day. This makes it hit higher than it does on a colder day. Moist air does not stop a bullet as much as dry air. A bullet will go straighter on a wet day than on a dry day and will hit the target higher.

Light:

Light has no effect on the bullet but it does affect the aiming. With the peep sight, a bright light makes the bullseye look so distinct that a man can hold very close and still see it all very easily. On a dull day the bullseye is not so distinct and the front sight has to be held a little lower down in order to see all the bullseye plainly. This will make the bullet go lower. A man usually shoots lower on a dull day than he does on a bright day when he uses the peep sight.

With the open sight a man usually shoots higher on a dull day because he can't see his rear sight notch so clearly and he sticks the front sight higher up than he thinks.

The errors due to the change of light are greater with the open sight than with the peep sight. Very often sunlight coming from the right will make you shoot a little to the left because you see the right side of the front sight more clearly and hold that part of it under the bullseye. Sunlight from the left makes you shoot to the right.

Mirage:

The heat waves seen near the ground on a target range are called "Mirage." These waves indicate which way the wind is blowing and must be watched carefully. Sometimes there is no wind at all on the firing point but quite a breeze further down the range. The heat waves will indicate which way it is blowing and how fast. The mirage waves lean the way the wind is blowing.

THE AIMING DEVICE.

This should be used freely in the preparatory sighting exercises, practice with the Hollifield Rod and gallery practice, to instruct the men in aiming and to correct errors. It is a great help to the instructor in teaching men to shoot, both in the preliminary work and in range practice.

HOLLIFIELD ROD.

Practice with the Hollifield Rod is a great help and costs practically nothing. With it men can be taught the correct position, and how to aim and squeeze the trigger. It should be used freely and in conjunction with the Belgian sighting device so that the instructor can correct at the very first any errors in sighting or trigger squeezing.

Practice should be had with it in rapid as well as slow fire. And with the sandbag rest. Men should be required to call their shots.

GALLERY PRACTICE.

The cost of ammunition for gallery practice is very small and if properly conducted a great deal can be learned through it. Each man should be watched and coached as carefully in gallery practice as in range practice. The aiming device should be freely used so as to correct errors at the very beginning. Marksmen and Sharpshooters whose preliminary range practice is limited by regulations should be given a great deal of gallery practice.

Practice should be had in slow and rapid fire and with the sandbag rest.

Men should be required to call their shots.

The "X" target and the iron target supplied by the Ordnance Department, are too large and tend to give a man a false idea of his shooting ability. The "Y" target will do very well for all ranges.

It is best to use paper targets, ten shots to each target, and to keep a file of each man's targets, with his name, date, range and position written on each. In this way each man will see when his target is brought to the firing point just what he has done and the instructor can point out his errors to him. The instructor can tell by looking through a man's file of targets what progress he has made and in what kinds of fire he needs the most instruction. A plate for printing "Y" targets can be purchased at a small cost and the Post Printer can print several thousand of them for very little. Small Rapid Fire targets should be obtained in the same way.

A small target range with pit and revolving targets help to add interest to gallery practice, and it facilitates the work. The target frames can be on each end of a light piece of board which revolves on a pivot in the middle, at right angles to the line of fire.

It is best to begin gallery practice in the prone position with sandbag rest. This will help to keep the man from getting into bad trigger squeeze habits at the very start.

Gallery rifles should be cleaned every ten rounds. The cartridge holders should be cleaned frequently with a solution of sal soda and during the gallery season they should be kept in kerosene when not in use.

Gallery practice is of no value if the rifles are not accurate. If the mouth of the cartridge holder is dented the shot will go wild. This must be constantly watched and dented cartridge holders repaired or discarded. To avoid injuring the holders always use the rifle as a single loader and push the holder into the chamber with the hand, not with the bolt. In rapid fire practice have some one sit beside the man firing and load in a holder each time the bolt is pulled back. To compensate for the loss of time in doing this allow about five seconds more on the time.

Competitions between individuals, squads, platoons and companies should be held.

SCORE BOOKS.

Each man should be required to keep an accurate record of each shot fired on the range and a score book for that purpose should be issued to him at the beginning of the preparatory season. The wind chart should be explained to him and he should be shown how to correct elevation and windage to bring his shots to the center of the target. He should be given windage and elevation correction drills as laid down above.

ESTIMATING DISTANCE DRILLS.

(See Small Arms Firing Manual, Chap. V.)

QUALIFICATION COURSE.

Each man should know before going on the range how many shots he has to fire in the qualification course in slow and rapid fire at each range, how much he will have to make to qualify and what he will have to average at each range.

HABITS.

Alcohol and tobacco affect both the eyes and the nerves in direct proportion to the amount used. A smoker will find that he has much clearer vision on quitting tobacco. It is best to stop entirely the use of both alcohol and tobacco at least a month before going on the range. But it will be a help to quit at any time during the target season.

PHYSICAL CONDITION.

A good physical condition is a big help in shooting. The so-called push and pull exercises laid down in the Small Arms Firing Manual should be given frequently to strengthen the muscles, and such gymnasium and calisthenic exercises as tend to strengthen the wrist, arm, shoulder, and back should be encouraged.

RANGE PRACTICE

If a man has been properly instructed and drilled in the preparatory exercises, practically all of the period of range practice can be devoted to teaching him to squeeze the trigger properly. He must be carefully watched, however, during each shot to see that he does not develop bad habits as to position, breathing, aiming or trigger squeezing.

Pads:

Men should be required to use pads on the shoulder and on both elbows.

TRIGGER SQUEEZE.

There are not two correct methods of squeezing the trigger. There is only one, and that is to squeeze it with such a steady increase of pressure as not to know when it is going off. The excellent shots are the ones who, through training, have learned to increase the pressure only when the sights are in absolute alignment with the bull's-eye. When the sights get slightly out of alignment they hold what they have with the finger and only go on with the increase of pressure when the sights become properly aligned again. They never "give it the rest" or "set it off."

The difference between bad shots and good shots, good shots and very good shots, and very good shots and excellent shots, is only the difference in their ability to squeeze the trigger properly. The whole heart and soul, the beginning and end, of target shooting is the trigger squeeze.

Any man with any eyesight at all and strength enough to carry himself around can align the sights on the target and hold them there for an appreciable space of time. When he has acquired the will power and self control to forget that there is to be an explosion and a shock, and squeezes on the trigger with a steady increase of pressure until it goes off by itself, he has become a good shot, and not until then.

This applies to rapid fire as well as slow fire. The increase of pressure is faster in rapid fire, but the process is the same.

COACHING.

Each man should be carefully watched by a competent coach while firing each shot. Bad shooting habits should be detected and corrected before they become fixed. Very often a coach can tell that a shot is a bad one even before it is marked.

WATCHING THE EYE.

Errors in trigger squeeze, which are the most serious and the hardest to correct, can be detected by lying down to the right of the man shooting and watching his eye. If his eye can be seen to close as the rifle goes off it is because he knew when it was going off and consequently was not squeezing the trigger properly. The explosion and shock will cause a man to wink, but this cannot be seen due to the sudden movement of the head that takes place at the same time. If he can be seen to wink it is because he "set it off" and winked at the same time. If his trigger squeeze is correct and his shots are still scattered his sighting should be watched through the aiming device and his breathing observed by watching his back.

It is sometimes necessary in bad cases to have four coaches watch a man fire a shot. One observes his aiming through the aiming device, one watches his eye to see if he flinches, one watches his back to see if he is breathing or holding his breath while aiming, and the fourth stands behind him to correct him if he cants the rifle.

Great patience should be exercised by the instructor so as not to excite or confuse the man and everything should be done to encourage him. It is often a good plan to change instructors. It is necessary to do so when the instructor shows signs of reaching the limit of his patience.

One thing should be borne in mind: There is no such thing as a hopeless case. No matter how many target seasons a man has been through without learning to shoot, no

matter how many bad shooting habits he has, no matter how hopeless he seems at first, he can be taught to shoot.

It is often advisable to send a man back to gallery practice and preliminary drills after he has been firing for a while on the range. It will help to steady him down.

When a man is flinching and does not realize it, dummy cartridges used in such a way that he does not know whether the rifle is loaded or not are useful in bringing it home to him. But once he realizes he is flinching the cure rests in careful coaching rather than the indiscriminate use of dummy cartridges.

THE SILENCER.

The silencer is used with recruits, and sometimes bad flinches can be cured by its use, as it reduces the shock as well as the noise.

CHANGING THE SIGHT.

Always hold the same way on the bull's-eye. Never try to make a bullet hit close to the bull's-eye by changing the aiming point. When you want to change the hitting place of the bullet do so by changing your rear sight. But always aim at the bottom edge of the bull's-eye for all shots. In rapid fire with the battle sight you may have to hold higher or lower because you cannot change the sight. But in all slow fire shooting aim always at the bottom edge of the bull's-eye.

RAPID FIRE.

Many of the rifles shoot too low at 500 yards, battle sight. This necessitates holding above the figure at that range, which results in poor scores, as the object fired at is below the line of sight. To correct this error replace the front sight with a LOWER one to make the rifle shoot higher so that a normal aim may be taken. This should be done as early in the season as possible, so that the man will know his elevation for all ranges with that sight.

An excess of oil on or in the bolt causes small drops to be thrown against the face. In rapid fire this always results

in lower scores. All oil should be removed from all parts of the bolt. They should be then gone over with a cloth moistened with vaseline.

Spotters should be used in Rapid Fire. When the target comes back up with a spotter on each shot hole, the man sees at once what he has done. He knows exactly where his shot group is and can plot it accurately in his score book.

Training in rapid fire will pay well for itself in increased scores. Most men make much less in rapid fire than they do in slow fire. But with proper training their rapid fire scores should be equal to or greater than the scores made in slow fire.

An excellent form of rapid fire practice is to mix five dummy cartridges with five good cartridges and fill two clips with them. The man then fires a rapid fire score with these two clips, and only five of his shots will go off. This saves ammunition and shows the instructor and the man himself whether he is flinching or not. This form of practice will rattle most men at first, but the ultimate result will be to steady them down to careful trigger squeezing.

To make dummies for this practice have one man hold a cartridge in a clip while another man pulls the bullet out with a pair of pliers. Then empty out the powder, snap the cap and replace the bullet. The bullet must be pulled straight out. If it is twisted sideways it will spring the shell so that the bullet will not stay in when used as a dummy cartridge. Five of these dummy cartridges for each firing point should do for a whole season.

FINAL INSTRUCTIONS.

For Slow Fire at Each Range:

The following should be read to the men just before going to the firing point for record practice:

Clean oil out of rifle.

See that the screws in your rifle are tight.

Blacken sights.

Know what target you are going to shoot on and look at that number before each shot.

Take your score book to the firing point and get your elevations from it for the first shot.

Fire your first shot very carefully and then if necessary change the sights to bring the second shot into the bullseye.

Plot all your shots in the score book. Watch score book to see where your group is going. Try to bring the center of the group into the center of the bullseye. Don't change your sights without thinking it over. If you have made two or three good shots and then make a bad one, don't change your sights on account of the bad one because it is almost certain that you pulled it wrong.

Don't change your windage until you have looked at your score book to find out how much of a change you need, then look at your wind gauge to see how much you have before you start to make a change.

The first thing to do when you get a bad shot is to look at your sight to see if it has jumped sideways or has been jarred down.

Be sure you get a good comfortable position before you begin to shoot and don't shift around during the score, especially if you are doing good shooting.

At 600 yards be sure to get the sandbag **ABSOLUTELY** right before you start to shoot. Then don't lose the position by moving around between shots unless it is necessary to get a more comfortable position.

Finally:

Fire each shot as if your whole qualification depended on that one shot because when you get through you may find that it did.

Hold hard and squeeze carefully. That is all there is to good shooting. To hold hard and squeeze carefully.

For Rapid Fire:

As soon as you get on the firing line pick out the place from which you are going to shoot and practice getting

down into it two or three times, so as to be sure it is all right and so as to know just where to stand when the command "ready" is given.

Pick out your own target by number before starting to shoot and then keep your eye on it for all five shots. Don't look into the chamber while loading each cartridge. Do the same with the second five shots.

Gain time in working the bolt so as to have plenty of time to aim.

Fire your first shot carefully and make it a good one.

Finally:

Hold hard and squeeze carefully. The whole secret of rapid fire shooting is to **HOLD HARD AND SQUEEZE CAREFULLY.**

APPENDIX

EXAMINATION OF MAN BEFORE STARTING RANGE PRACTICE.

(NOTE—The answers given herein are merely examples. Men should be required to explain them in their own words.)

Q. What is this? (Drawing a circle on the ground or on paper.)

A. A circle.

Q. Where is the center of it? A. Here. (Pointing to center.)

Q. Suppose that circle to represent a peep sight, which you are looking through, and you are told to bring the top of the front sight to the center of it, where would the top of the front sight be? A. Here. (Pointing to center.)

Q. Make a mark in the circle to represent the front sight.

Q. Make a small circle to represent the bullseye.

Q. Is it in the center of the peep sight? A. No, the bottom edge of it is in the center.

Q. Why? A. Because the top of the front sight is in the center and it just touches the bottom edge of the bullseye.

Q. Should the front sight be held up into the bottom of the bullseye? A. No, it just touches the bottom edge of the bullseye so that all of the bullseye can still be clearly seen.

Q. What is this? (Indicating sighting bar.) A. Sighting bar.

Q. What is it for? A. To teach men how to sight.

Q. Why is it better than a rifle for the purpose? A. Because the sights on it are much larger and slight errors can be more easily seen and pointed out.

Q. What does this represent? A. The front sight.

Q. And this? A. The rear sight.

Q. What is this? A. The eye piece.

Q. What is it for? A. To make a man hold his head in the right place, so that he sees the sights properly aligned.

Q. Is there an eye piece on a rifle. A. No, a man learns by the sighting bar how the sights look when properly aligned and he must hold his head so as to see the sights the same way when aiming a rifle.

Q. Tell me what is wrong with these sights? (The instructor now adjusts the sights of the bar with various slight errors, first with the sights pointing at a blank wall or paper to show the correct and incorrect adjustments of the sights and then with the sights properly adjusted, he sights on a small bullseye to demonstrate correct and incorrect aiming; require the man to point out any errors. This is done with both the open and peep sights.)

Q. What is the difference between the way you aim with peep sight and the way you aim with the open sight? A. There is no difference. In both, the top of the front sight is brought to the center of the circle. With the open sight the top half of the circle is not there; just as if it had been cut off and carried away.

Q. Now take this sighting bar and point it at that blank paper and adjust the sights properly. (Verified by the instructor.)

Q. Now that the sights are all right, have the small bullseye moved until the sights are properly aimed at it. (It is easier to move the small bullseye on a disk to the proper place than to try to adjust the sights on a fixed bullseye.)

Q. How do you squeeze the trigger? A. I squeeze it with such a steady increase of pressure as not to know just when the rifle will go off.

Q. What do you know while you are squeezing the trigger? A. I know that my sights are lined upon the bullseye.

Q. If the sights get slightly out of alignment what do you do? A. I hold the pressure I have on the trigger and only go on with the increase of pressure when the sights become lined up with the bullseye again.

Q. If you do this can your shot be a bad one? A. No.

Q. Why? A. Because I can't flinch, for I don't know when to flinch and the sights will always be lined up with the bullseye when the rifle goes off, because I never increase the pressure on the trigger, except when they are properly lined up.

Q. Is it necessary to take a long time to press the trigger in this way? A. No, I press it in the same way in rapid fire. The increase of pressure is faster, but it is so steady that I do not know just when the rifle is going off.

Q. What is this? A. A sighting device.

Q. What is it used for? A. To show the instructor how a man is aiming.

Q. Now I will take this rifle, and with the aid of the sand bag rest to hold the rifle steady, I will aim at the bullseye and you will watch the sights through the aiming device and tell me when my aim is right and when it is wrong, and what the error is when wrong. (The instructor now aims so as to illustrate the common faults and the man must observe and call attention to them.)

Q. I will now snap at a bullseye a few times and you will watch through the sighting device and call where the shots would have hit.

Q. Now take this rifle and, using the sand bag rest, aim at the bullseye, and I will watch you through the device (Instructor satisfies himself that the man understands sighting and aiming and requires him to snap a few times and to call his shots.)

Q. I will take the rifle and assume the kneeling, sitting and prone positions, and position with sand bag rest, and you will tell me whether the position is correct or incorrect in each case. (Gun Sling is adjusted in all these tests.)

Q. Take this rifle and show me your kneeling, sitting and prone positions, and position with sand bag rest.

Q. Now show me how you take the sitting and prone positions rapidly from a standing position.

Q. In rapid fire how do you gain time so as not to have to hurry aiming and squeezing the trigger? A. I gain time by taking the position rapidly, working the bolt rapidly and by keeping my eye on the target while working the bolt.

Q. How does keeping your eye on the target help you to gain time? A. A man who looks into the chamber while working the bolt always works it slowly so as to see the cartridges run in, and he loses time in finding his own target again.

Q. What other fault, in rapid fire, comes from looking into the chamber while working the bolt? A. Firing on the wrong target.

Q. Show me how you work the bolt in rapid fire, both sitting and kneeling.

Q. Is it important to get into the correct position before beginning to shoot in rapid fire? A.. Yes, even though it takes more time, I should always get into the correct position before beginning to shoot.

Q. How do you breathe while aiming? A. After I get my sights lined up on the bullseye I draw in an ordinary breath and hold it while aiming and squeezing the trigger.

Q. Take the prone position and aim and snap at that mark. (Instructor must assure himself that the man knows how to properly hold his breath while aiming. Many men have great difficulty in learning to do this in the right way.)

Q. What is meant by "calling the shot"? A. To say where you think the bullet hit as soon as you shoot and before the shot is marked.

Q. How can you do this? A. By noticing exactly where the sights point when the rifle goes off.

Q. If a man can't call his shot properly what does it usually indicate? A. That he did not squeeze the trigger properly and did not know where the sights pointed at the time the rifle went off.

Q. What is this? A. A score book.

Q. What are these lines for? A. To show the amount of change in elevation necessary to bring a shot to the middle of the line.

Q. What are these lines for? A. To show the amount of change in windage necessary to bring the shot to the middle line.

Q. If a shot hits here (indicating) what change in your sights would you make to bring the next shot to the center of the bullseye? A.

Q. What effect does moving your rear sight have on the shot? A. It moves it in the same direction as the rear sight moves.

Q. If you want to make the shot hit higher, what do you do? A. I raise my rear sight.

Q. If you want to make your shots hit more to the right, what do you do? A. I move my rear sight to the right.

Q. If you move your rear sight one point of windage, how much will it move your hitting place? A. Four inches for each hundred yards of range.

Q. Explain what you mean by that. A.

Q. I will place this spotter on this target (full size 500-yard target) to represent a shot properly fired by you at 500 yards with zero windage and sights set at 500 yards. Take your rifle and move your sights to bring the next shot to the center of the bullseye. (Instructor now tests in various ways the man's ability to make proper sight corrections.)

Q. What are the three principal uses of the score book? A. To show me where my shot group is going, to indicate how much change in the sights is necessary to move a shot or group of shots to the center of the target, and to make a record of the sight settings of my rifle for the different ranges under various weather conditions, so that I will know where to set my sights when starting in to shoot at each range, and under different weather conditions.

Q. Tell me what effect different light and weather conditions have on a man's shooting. A.

